INEEL STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION ACTIVITIES-GENERIC PLAN

1. INTRODUCTION AND SCOPE

The Idaho National Engineering and Environmental Laboratory (INEEL) must comply with the National Pollutant Discharge Elimination System (NPDES) (40 CFR 122) *General Permit for Storm Water Discharges from Construction Activities* issued by the U.S. Environmental Protection Agency (EPA) on February 17, 1998 (EPA 1998, see Appendix D). The General Permit requires a storm water pollution prevention plan for construction activities (SWPPP-CA) to be implemented on May 18, 1998. This plan addresses **discharge of storm water associated with construction activities** at the INEEL that have a potential to discharge storm water to **waters of the United States**. It presents **control measures** for storm water pollution prevention. It discusses site descriptions, **pollution prevention practices, construction,** implementation, maintenance, inspection, and notifications. (See Section 6, "Definitions," for bold terms.)

The U.S. Department of Energy Idaho Operations Office (DOE-ID) and Lockheed Martin Idaho Technologies Company (LMITCO) are co-permittees of the General Permit. The DOE-ID and LMITCO share operational control of specifications and plans. The DOE-ID has responsibility for funding activities to ensure compliance with permit conditions. The DOE-ID is also responsible for decisions concerning policy, programmatic direction, and prioritization. Lockheed Martin Idaho Technologies Company has operational control of activities to ensure compliance with permit conditions in its role as the management and operating contractor to DOE-ID. In that role, LMITCO usually prepares project-specific SWPPP-CAs, procures general construction contractors and subcontractors, and provides oversight of their activities. Construction activities may involve INEEL organizations, subcontractors, or other entities. LMITCO is only responsible for the construction activities of its employees and subcontractors.

The Notice of Intent submitted to the EPA by DOE-ID and LMITCO in May 1998 (see Appendix E) is sufficient for all construction projects on the INEEL. For construction projects off-Site, such as in Idaho Falls, a Notice of Intent may be required.

1.1 Purpose

The General Permit is based on national studies that pointed to storm water discharges as a significant source of **pollutants** (see definition) and cause of water use impairment in receiving streams. Storm water runoff becomes polluted as it flows over surfaces where construction activity is taking place and picks up soil particles and other pollutants. The EPA's goal of storm water management is to improve water quality by reducing pollutants in storm water discharges.

The General Permit does not authorize storm water discharges from construction sites that cause, or have reasonable potential to cause or contribute to, violations of water quality standards. The EPA determined the best approach to storm water management for construction sites is through self-designed storm water pollution prevention plans based on the use of control measures. For construction sites, there are three types of control measures: those that prevent erosion, those that trap pollutants before they can be discharged, and those that prevent contact between pollutants and storm water runoff. The plans are

designed to prevent or minimize the pollution of storm water before it has a chance to affect receiving streams.

1.2 Compliance With Other Acts

1.2.1 Endangered Species Act

The *Endangered Species Act* establishes a program for the identification and conservation of listed species and critical habitat. The Act requires federal agencies to take into account the effects of their actions on the species and habitat. The EPA has included several conditions in the General Permit to ensure the activities that it regulates protect listed species and critical habitat. In addition, the General Permit's coverage does not extend to discharges and discharge-related activities likely to jeopardize the continued existence of species proposed but not yet listed as endangered or threatened or result in the adverse modification of habitat proposed to be designated critical habitat (EPA 1998). Project SWPPP-CAs address means to ensure compliance with the Act.

1.2.2 National Historic Preservation Act

The *National Historic Preservation Act* establishes a national historic preservation program for the identification and protection of historic properties and resources. Federal agencies are required to take into account the effects of their actions on historic properties that are listed or eligible for listing on the National Register of Historic Places. The General Permit was proposed with a number of conditions pertaining to the consideration of historic properties. The EPA has decided to not include those conditions at this time. The EPA will continue working towards the possible development of a more comprehensive and efficient approach to ensure that effects to historic properties are given appropriate consideration while ensuring undue burdens are not imposed on applicants and regulatory authorities. The EPA may modify the General Permit to incorporate procedures regarding the protection of historic properties and resources later (EPA 1998), and this plan would be revised accordingly.

1.3 Idaho Requirements

In addition to the requirements for coverage identified in the General Permit, the SWPPP design and associated storm water discharge quality shall demonstrate compliance with applicable Idaho water quality standards (EPA 1998). The Idaho water quality standards are published in the Idaho Department of Health and Welfare (IDHW) Rules and Regulations. The Big Lost River, Birch Creek, and Little Lost River are protected from their sources to the playas (IDHW 01.02.150). The general surface water quality criteria address the following topics:

- Hazardous materials
- Toxic substances
- Deleterious materials
- Radioactive materials
- Floating, suspended, or submerged matter
- Excess nutrients

- Oxygen demanding materials
- Sediment (IDHW 01.02.200).

As of May 1998, the classifications of the waters were those shown in Table 1-1 (IDHW 01.02.150). The water quality criteria for each classification are stated in Section 250 of the Water Quality Standards and Wastewater Treatment Requirements (IDHW).

The INEEL will demonstrate compliance in accordance with EPA's interim approach for water quality-based effluent limitations in storm water permits (EPA 1996). The interim approach uses pollution prevention practices to provide for the attainment of water quality standards. The INEEL will use pollution prevention practices and monitoring (performing visual inspections and implementing corrective measures) as required by the General Permit to ensure that SWPPP design and associated storm water discharge quality demonstrate compliance with Idaho water quality standards. Pollution prevention practices, inspections, and corrective measures are detailed in Section 4 of this plan, "Project SWPPP-CAs."

1.4 Penalties for Noncompliance

Noncompliance with permit conditions may constitute a violation of the *Clean Water Act* and may be grounds for enforcement action, including permit termination, revocation and reissuance, modification, or denial of a permit renewal application. Substantial penalties may result from violations of permit conditions and could include the following categories: (1) criminal violations (negligent violations, knowing violations, knowing endangerment, and false statement), (2) civil penalties, (3) administrative penalties, (4) penalties for falsification of reports, and (5) penalties for falsification of monitoring systems. Table 1-2 specifies the types of violations and associated penalties, as stated in the General Permit.

Facility and project SWPPP-CAs implement the requirements of the *Clean Water Act* and the General Permit. Failure to comply with the requirements of a specific SWPPP-CA can constitute either civil or criminal (if knowing or willful) violations of the law.

Table 1-1 Classifications for surface water.

Waters	Domestic Water Supply	Agricultural Water Supply	Cold Water Biota	Warm Water Biota	Salmonid Spawning	Primary Contact Recreation	Secondary Contact Recreation	Special Resource Water
Big Lost River	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Birch Creek	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Little Lost River	No	Yes	Yes	No	Yes	Yes	Yes	No

Table 1-2. Penalties for noncompliance with permit requirements.

General Permit Reference and Penalty Category	Penalty
Part VI.A.2.a.(1) Criminal/Negligent Violations	"The CWA [*Clean Water Act*] provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both."
Part VI.A.2.a.(2) Criminal/Knowing Violations	"The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both."
Part VI.A.2.a.(3) Criminal/Knowing Endangerment	"The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both."
Part VI.A.2.a.(4) Criminal/False Statement	"The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than 2 years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the *Clean Water Act*)."
Part VI.A.2.b. Civil Penalties	"The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $25,000 per day for each violation."
Part VI.A.2.c. Administrative Penalties	"The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows: *(1) Class I penalty* - Not to exceed $11,000 per violation nor shall the maximum amount exceed $27,500. *(2) Class 2 penalty* - Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500."
Part VI.H. Penalties for Falsification of Reports	"Section 309(c)(4) of the *Clean Water Act* provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or by both."

Note: CWA Sections listed are: 301, "Effluent Limitation," 302, "Water Quality Related Effluent Limitations," 306, "National Standards of Performance," 307, "Toxic and Pretreatment Effluent Standards," 308, "Inspections, Monitoring and Entry," 318, "Aquaculture," 405, "Disposal of Sewage Sludge," and 309(c)(4), "False Statements."

1.5 Records

Storm water pollution prevention plans and all reports required by the General Permit shall be retained for at least three years from the date the site is stabilized (EPA 1998). The records are under the custody of the INEEL storm water coordinator.

1.6 Accessibility

A copy of the storm water pollution prevention plan shall be retained at a location accessible to the EPA Director and the public from the date of project initiation to the date of final stabilization (EPA 1998). This plan is available at the INEEL Technical Library.

2. SITE DESCRIPTION AND ASSESSMENT

Following is a general description of the INEEL, including general information on its location, climate, topography and drainage patterns, soils, vegetation, and surface and subsurface hydrologic features. Some sources of information on specific facility areas are also provided.

2.1 Location

The INEEL occupies nearly 890 square miles (231 hectares) of dry, cool desert and is located along the western edge of the eastern Snake River Plain in southeastern Idaho. Most of the INEEL lies within Butte County, Idaho, although portions extend into Bingham, Bonneville, Jefferson, and Clark counties. All current site activities and facilities are situated well within the INEEL boundaries.

2.2 Climate

Except where noted, the information in this section has been obtained from *Climatography of the Idaho National Engineering Laboratory, 2nd Edition* (Clawson et al. 1989).

2.2.1 Temperatures

Site temperatures are important for revegetation, snowmelt discharge potential, and other construction activity considerations. Temperatures at the INEEL are characterized by large daily and seasonal fluctuations. During summer, low humidities and clear skies result in high temperatures and high evaporative demand during the day and rapid radiation cooling resulting in low temperatures at night. Winters are cold with two to three months having mean temperatures below freezing (Figure 2-1). The average annual temperature at the INEEL is 5.4°C (41.7°F), and the frost-free period is about 90 days. Topsoils usually remain frozen from mid- to late-November through mid-February.

2.2.2 Precipitation

Precipitation data are needed to design storm water management measures for both construction and post-construction periods. The INEEL is located in the rain shadow of the central Idaho mountain ranges and receives an annual precipitation of 224 millimeters (8.8 inches). Snow cover typically persists for two to three months or more. Figure 2-1 shows the general seasonal precipitation and temperature trends at the INEEL. Table 2-1 is a compilation of monthly precipitation data averaged over 43 years.

Precipitation is measured at the following five meteorological monitoring stations on the INEEL: Argonne National Laboratory West (ANL-W), Central Facilities Area (CFA), Test Area North (TAN), Radioactive Waste Management Complex (RWMC), and the Grid-III tower [east of Test Reactor Area (TRA) and north of Idaho Chemical Processing Plant (ICPP)].

2.3 Topography

The INEEL Site, located in the relatively flat eastern Snake River Plain, is bordered on the north and west by the Lost River, Lemhi, and Bitterroot-Centennial mountain ranges. A broad topographic ridge extends to the east along the north-central axis of the eastern Snake River Plain. The ridge effectively separates the drainage of the mountain ranges north and west of the INEEL Site from the Snake River. (See Section 2.6.2 for more specific drainage information.)

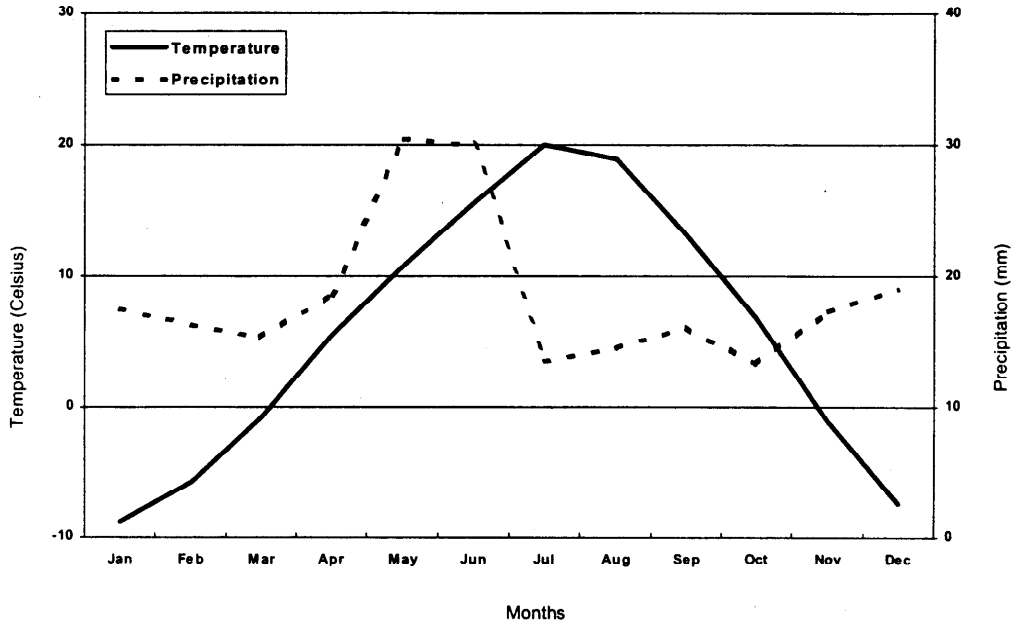


Figure 2-1. Climate diagram for the Idaho National Engineering and Environmental Laboratory, based on data for 37 years from the Central Facilities Area.

Table 2-1. Monthly precipitation data averaged over 43 years for the Central Facilities Area.[a]

Month	Monthly Total (in.)	No. Days Precipitation per Month[b]	Average Precipitation per Precipitation Day (in.)
January	0.69	7.44	0.09
February	0.64	6.72	0.10
March	0.60	6.20	0.10
April	0.73	6.00	0.12
May	1.20	7.75	0.15
June	1.18	7.13	0.17
July	0.53	3.72	0.14
August	0.57	3.72	0.15
September	0.63	3.60	0.18
October	0.52	3.72	0.14
November	0.68	5.70	0.12
December	0.75	7.13	0.11

a. Personnel communication from N. Hukari (NOAA) to Dennis Walker (EG&G, Idaho) 1992.

b. Number of days per month receiving 0.01 inch or more of precipitation.

2.4 Soils

The type of soil needs to be considered when designing erosion and sediment controls. Geologically, the surface of the INEEL is quite variable and includes loam, clay, loess, lacustrine sediments, various alluvial materials, sand dunes, and basalt. The surface soils vary widely in depth and water-holding capacity. Figure 2-2 shows general soils information for the INEEL (Olson, Jeppesen and Lee 1995).

2.5 Vegetation and Wetlands

Vegetation information is needed for revegetation planning and erosion control procedures during construction and post-construction activities. The INEEL is within the northern desert shrub biome. The vegetation types within the INEEL have been studied for the following environments: native upland vegetation (undisturbed), disturbed (developed sites), lava flow, and wetlands (Rope and Staley 1993). Figure 2-3 is a vegetation map for the INEEL. Also, Olson et al. (1995) describe typical vegetation for the soil types shown on Figure 2-3.

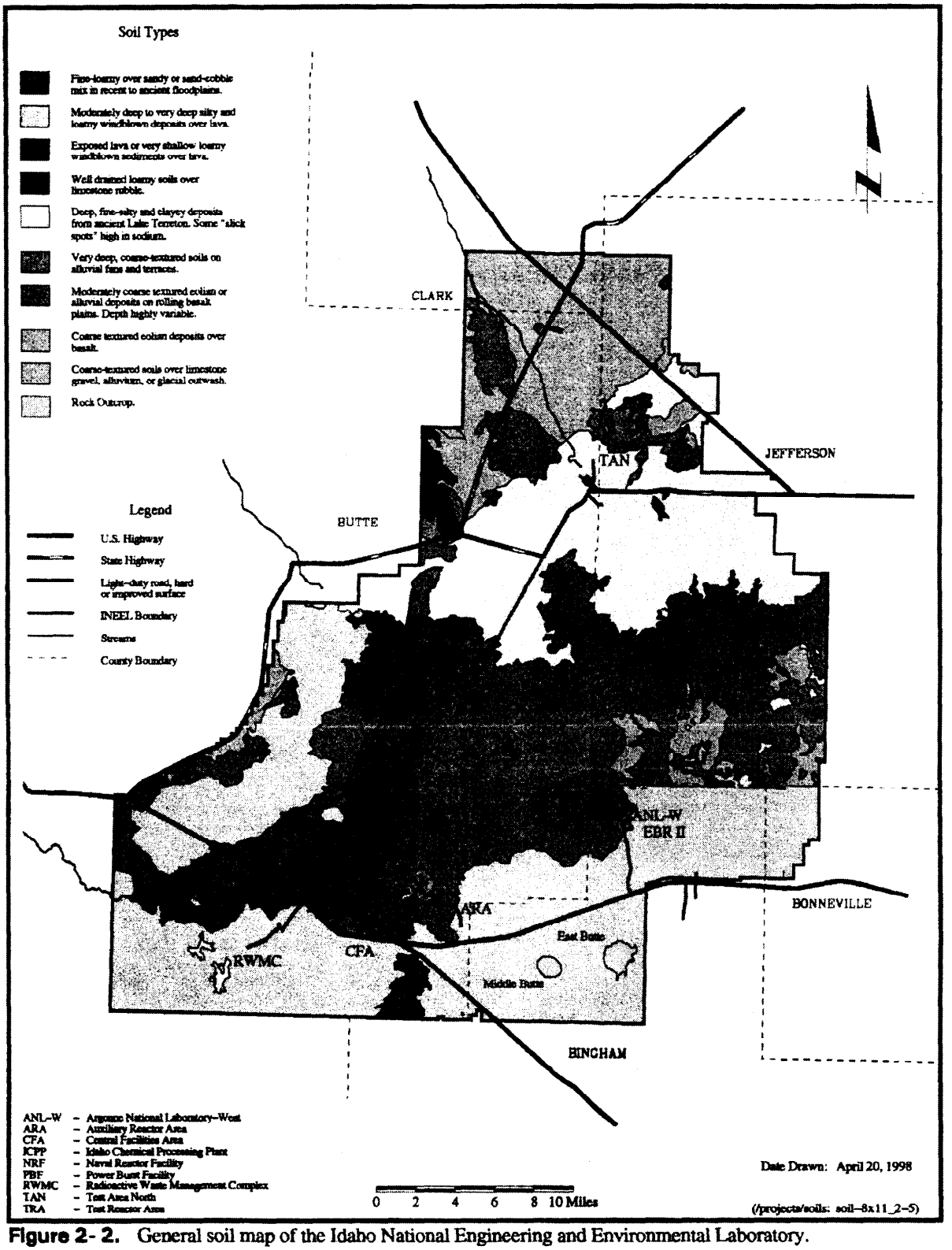


Figure 2-2. General soil map of the Idaho National Engineering and Environmental Laboratory.

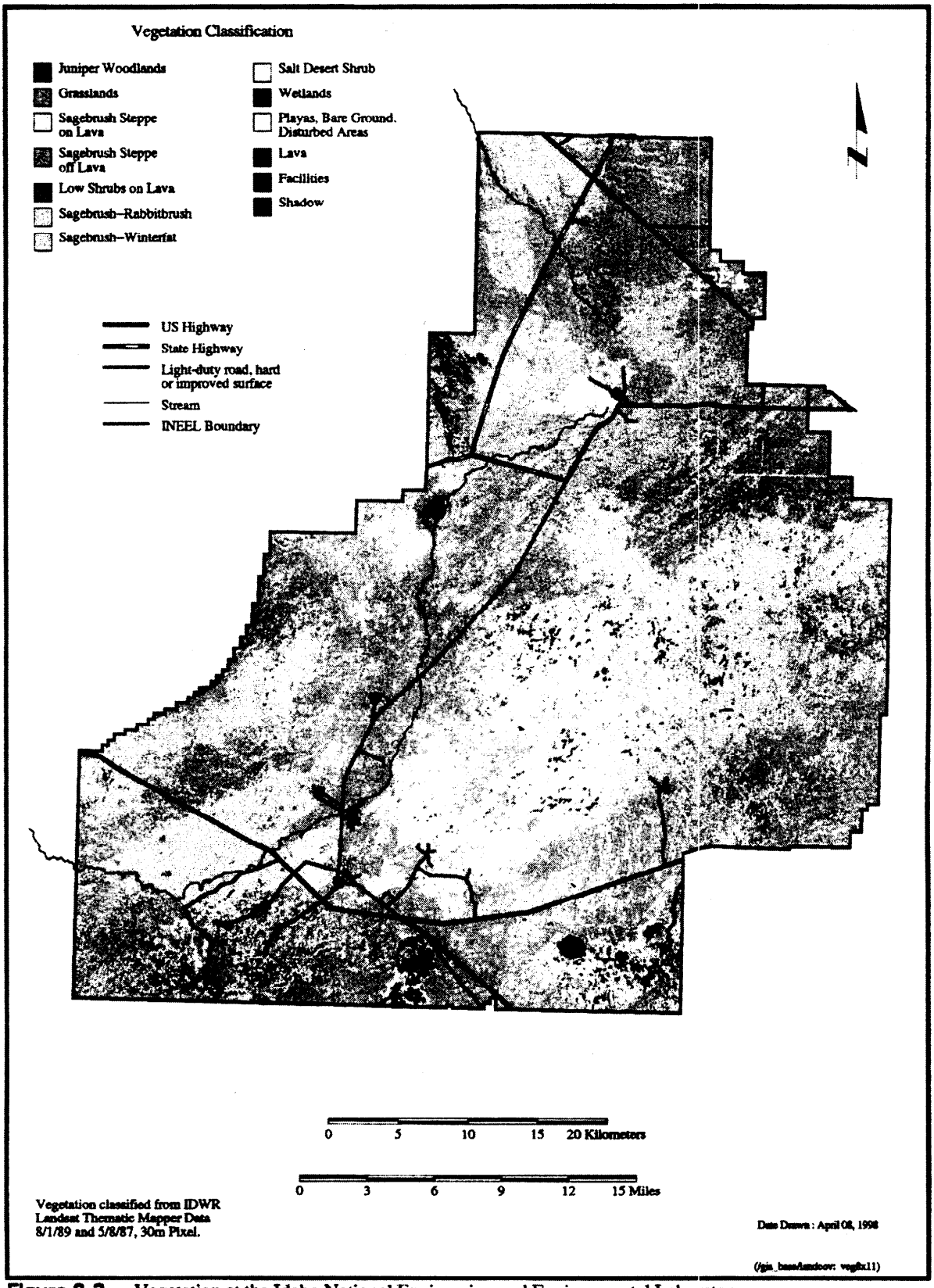


Figure 2-3. Vegetation at the Idaho National Engineering and Environmental Laboratory.

The undisturbed plant communities at the INEEL fall into five community types: saltbush desert, juniper woodlands, native grasslands, big sagebrush, and low sagebrush (Rope and Staley 1993). Disturbed areas are associated with the various facilities, highway and access roads, power lines, pits, and seeded areas. Table D-7 in Irving (1993) describes the disturbed communities and the wetland community.

Wetland and riparian areas can temporarily cover over 800 hectares (2,000 acres) of the INEEL during periods of high water flow in the Big Lost River and significant snowmelt events. The areas include spreading areas, sinks, playas and depressions, and manmade ponds and excavations. These areas have been evaluated by INEEL personnel to determine if any are regulated wetlands or waters of the United States. An area in the Big Lost River sinks has been identified as a regulated wetland, and is shown on the map of the Big Lost River System (see Figure 2-4). In addition, other aquatic habitats are included on the map.

2.6 Hydrology

This section presents general subsurface water, surface water, and flood potential information for the INEEL.

2.6.1 Subsurface Water

The Snake River Plain Aquifer is a continuous body of groundwater that underlies nearly all of the eastern Snake River Plain. It includes an area of about 24,900 square kilometers (15,440 square miles) and extends to as much as 1.06 kilometers (3,500 ft) below land surface (Bishop 1993). The depth to the aquifer at the INEEL varies from approximately 61 meters (200 ft) in the north to 275 meters (900 ft) in the south (Bishop 1993).

Recharge waters from the Big Lost River to the Snake River Plain Aquifer have been significant during wet years. However, according to Bishop (1993), recharge is generally less than discharge. Except for evaporation losses, all water flowing in the Big Lost River through the eastern Snake River Plain is recharged to the groundwater. The aquifer groundwater on the INEEL flows generally southwest from the north and northeastern recharge areas.

2.6.2 Surface Water

Prior to agricultural development, three major streams drained into the basin where the INEEL is located: Big Lost River, Birch Creek, and Little Lost River. The Big Lost River enters the INEEL annually, except during drought conditions. Figure 2-5 shows the annual discharge of the Big Lost River from 1965 to 1997 upstream of the INEEL diversion (the location of the diversion is shown on Figure 2-4). Water flowed continuously from May 1968 to May 1977 (9 years) and from March 1982 to April 1987 (5 years). There was no flow from August 1987 through April 1995, except during June 1993. The Big Lost River flows northeast and terminates in sinks and playas as shown on Figure 2-4. During spring runoff, some storm water flows into the Big Lost River. Typically, storm water drains to low-lying areas during the spring runoff.

Birch Creek flowed into the Birch Creek playa before it was diverted for irrigation and power production, and construction or gravel pits. Now Birch Creek flows into the INEEL in channels constructed below the power plant and has not reached the playa in recent years. Typically, Birch Creek flows into the INEEL when the ground is frozen.

NOTES: With the exceptions noted below, all hydrological features are based on DLG electronic data for 1: 24,000 scale maps obtained from the USGS.

1. Spreading Areas: Boundaries were delineated using July 1984, Landsat TM imagery which shows these areas full of water. The edge of the water was identified and digitized on screen to create the boundary file.

2. Playa No. 1: The USGS 1: 24,000 scale DLG electronic data for Playa No. 1 was arbitrarily extended over the INEEL boundary on the west side of the playa to indicate that irrigation water is taken at this point.

3. Playa No. 4: Ron Rope August 30, 1996, Interoffice Correspondence to Dennis Walker transmitting the Playa 4 Delineation Study information.

4. Hydrological features for the following USGS 7.5' Quads were digitized by Lowell Williams and Marci Cook in June 1992:

   A. Kettle Butte N.W.
   B. Kettle Butte S.W.
   C. Quaking Aspen Butte
   D. Richards Butte
   E. Terreton
   F. Scoville
   G. Big Southern Butte

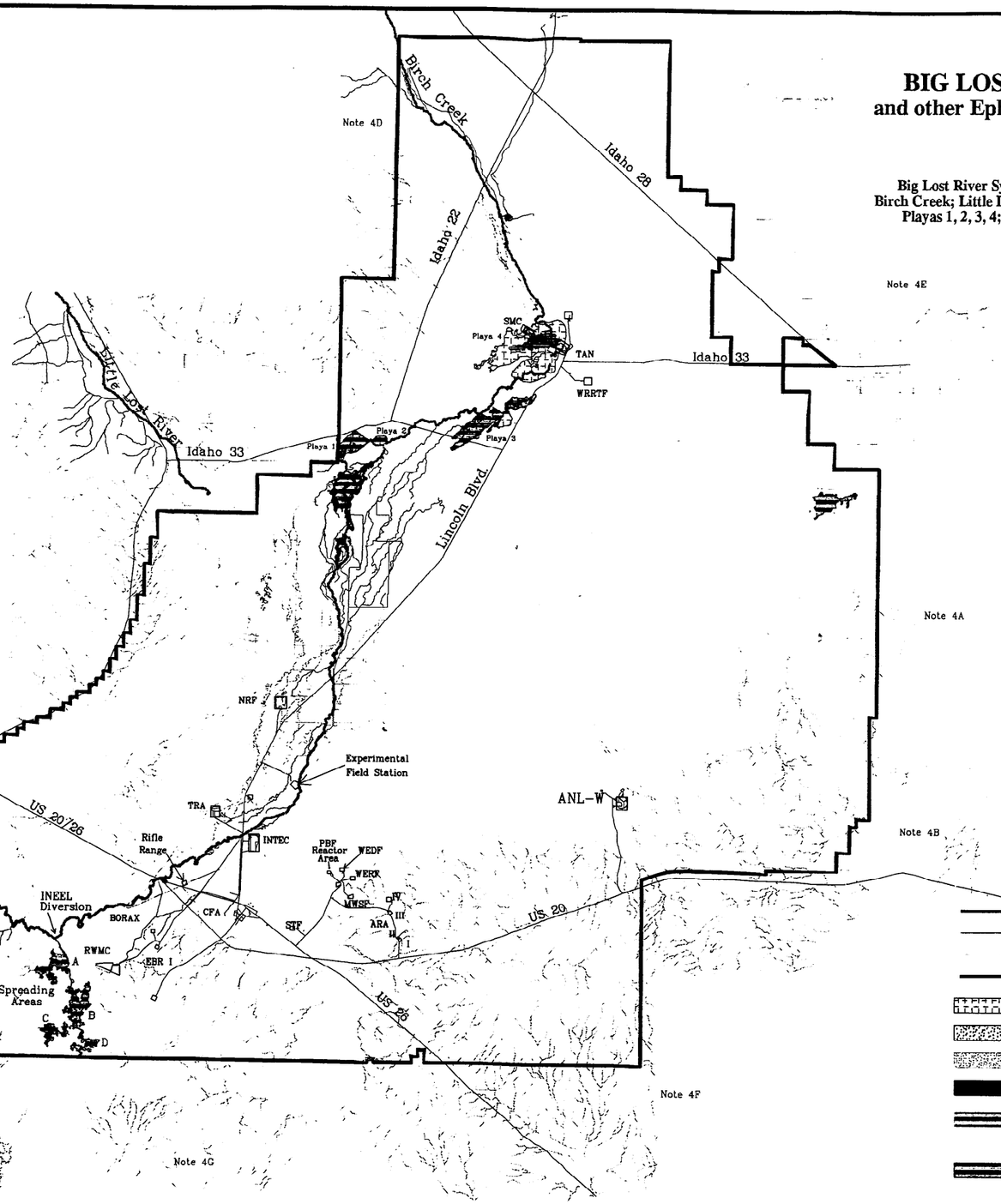
5. Birch Creek Diversion: Survey data from Sorensen Engineering, Idaho Falls, Idaho, February 1988, Birch Creek Hydroelectric Facility, Drawing No. D88-13429. Birch Creek Diversion includes the irrigation return flow from Reno Ranch.

6. Roads and Facilities: Based on digital data obtained from Aerial Mapping, 1993.

7. These areas include features mapped by the USGS, Fish and Wildlife Service National Wetlands Inventory, and INEEL personnel. Some areas characterized during field investigations are described in the following documents:
   Hampton, N.L., R. C. Rope, L. M. Glennon, and K. S. Moor. A Preliminary Survey of the National Wetlands Inventory as Mapped for the Idaho National Engineering Laboratory, February 1995. INEL-95/0101. National Technical Information Service, Springfield, Virginia.
   Rope, R. C., B. J. Grizzle, N. L. Hampton, J. A. Tullis, and J. M. Glennon. Characterization and Distribution of INEL Wetlands and Playas, Draft Report, September 1996.

BIG LOST RIVER SYSTEM
and other Ephemeral Aquatic Habitats

Big Lost River System includes the Big Lost River; Birch Creek; Little Lost River; Spreading Areas A and B; Playas 1, 2, 3, 4; and directly connected channels.



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INEEL SPATIAL ANALYSIS LABORATORY
APPLYING TECHNOLOGY TO MEET ENVIRONMENTAL NEEDS

Figure 2-4. The Big Lost River System.

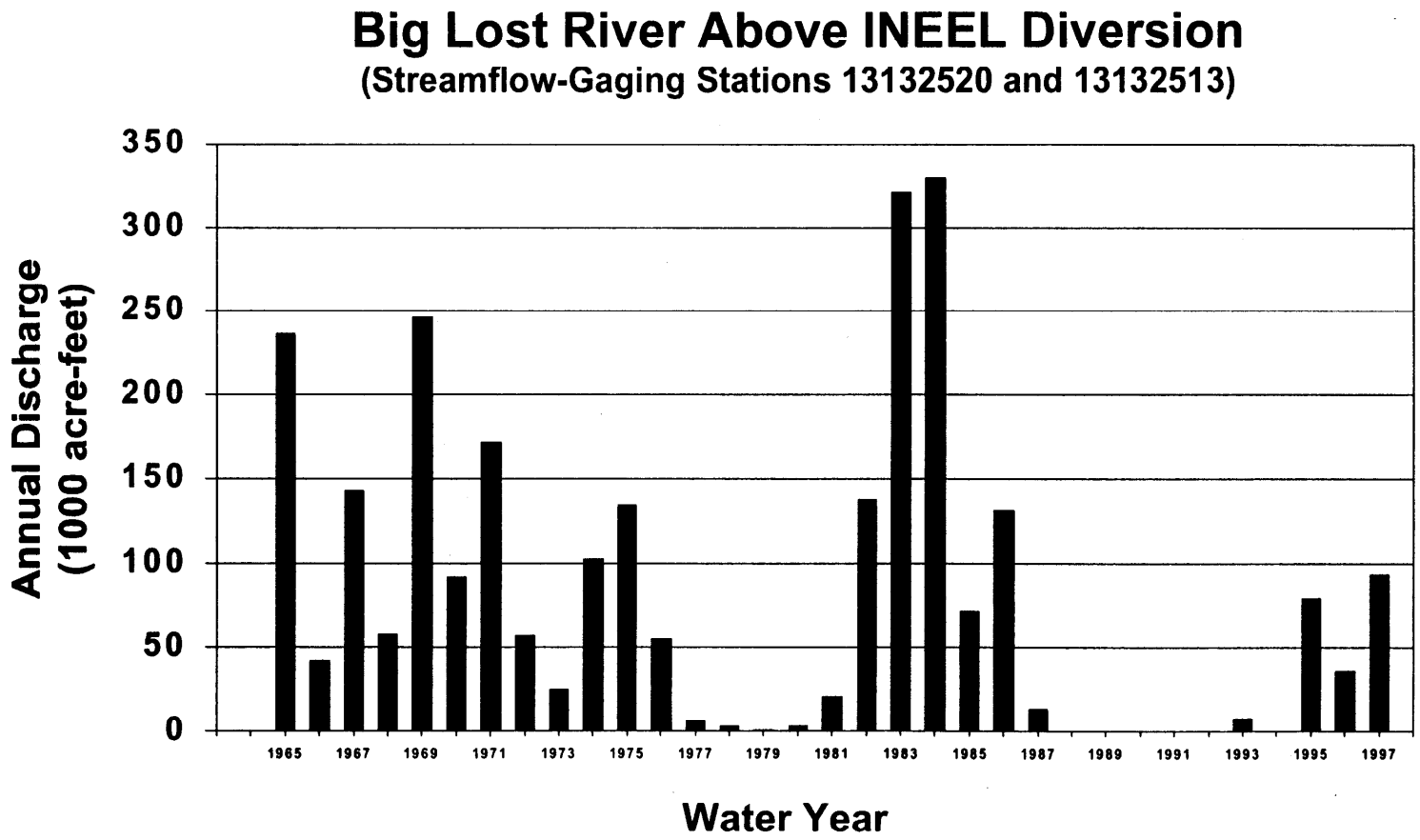

Figure 2-5. Big Lost River above INEEL diversion (Streamflow-Gaging Stations 13132520 and 13132513).

The Little Lost River flows to a playa at the INEEL boundary. However, it has not reached the INEEL in recent years.

Hinman (1993) (see Appendix E) summarizes EPA/DOE-ID discussions regarding which surface waters on the INEEL are waters of the United States as follows: the Big Lost River and tributaries with defined channels that directly connect to the Big Lost River are considered to be waters of the United States, as are the playas that terminate the Big Lost River. Isolated intermittent streams without defined channels directly connecting to the Big Lost River are not waters of the United States.

In November 1993, the Army Corps of Engineers designated Spreading Areas A and B near the RWMC as waters of the United States. Figure 2-4 shows the Big Lost River System, which is waters of the United States at the INEEL.

2.6.3 Flood Potential and Control

Flood potential from storm events and snowmelt also needs to be considered when planning for storm water discharge management at construction sites. Information regarding flood potential at the INEEL has been compiled in Volume 3 of the *Resource Conservation and Recovery Act (RCRA) Part B Permit Application for the INEL* (DOE 1992) for the southwestern and central INEEL, the northern INEEL, and the ICPP. Flood, runon, and runoff controls in the vicinity of specific waste management units for protection against localized storm events and rapid snowmelt runoff are presented in other volumes of DOE (1992) for the RWMC, ANL-W, Waste Experimental Reduction Facility [Power Burst Facility (PBF) area], New Waste Calcining Facility and Hazardous Chemical Waste Handling Facility (at ICPP), and Hazardous Waste Storage Facility (at CFA).

The Big Lost River commonly flows through the INEEL and is the nearest surface water body of potential influence to INEEL facilities, such as RWMC and ICPP. The Big Lost River is controlled by the Mackay Dam, 48 km (30 mi) northwest of Arco, Idaho. A flood diversion system was built in 1958 and modified in 1983 along the Big Lost River near the western boundary of the INEEL to divert flows that might create flood hazards for the INEEL facilities. Part of the flow from the main river channel is occasionally diverted into four spreading areas (Areas A, B, C, and D on Figure 2-4).

Flood control systems have been constructed at TAN, including three deep injection wells, several retention basins, and dikes around the west end of the Technical Support Facility (TSF). Berenbrock and Kjelstrom (1997) delineated areas that would be inundated by a 100-year peak flow in Birch Creek and concluded that the water surface would be about 2 feet lower than the TSF dike and the built-up Contained Test Facility (CTF). A similar study is in progress to delineate areas that would be inundated by a 100-year peak flow in the Big Lost River.

Deep injection wells have been drilled to manage snowmelt at or near PBF and CFA also.

2.6.4 Storm Water Discharge

Figure 2-6 shows an approximate area where storm water has a reasonable potential to discharge to waters of the United States. The drainage area is based on Bennett (1990) for the Big Lost River and its tributaries, spreading areas, and playas. The drainage area is based on Brenenbrock and Kjelstrom (1997) for Birch Creek and its playa. The INEEL plans to perform additional studies to further refine which areas of the INEEL have a potential to discharge storm water to waters of the United States. In the meantime, the requirements of the General Permit will be applied to projects within the area shown in Figure 2-6.

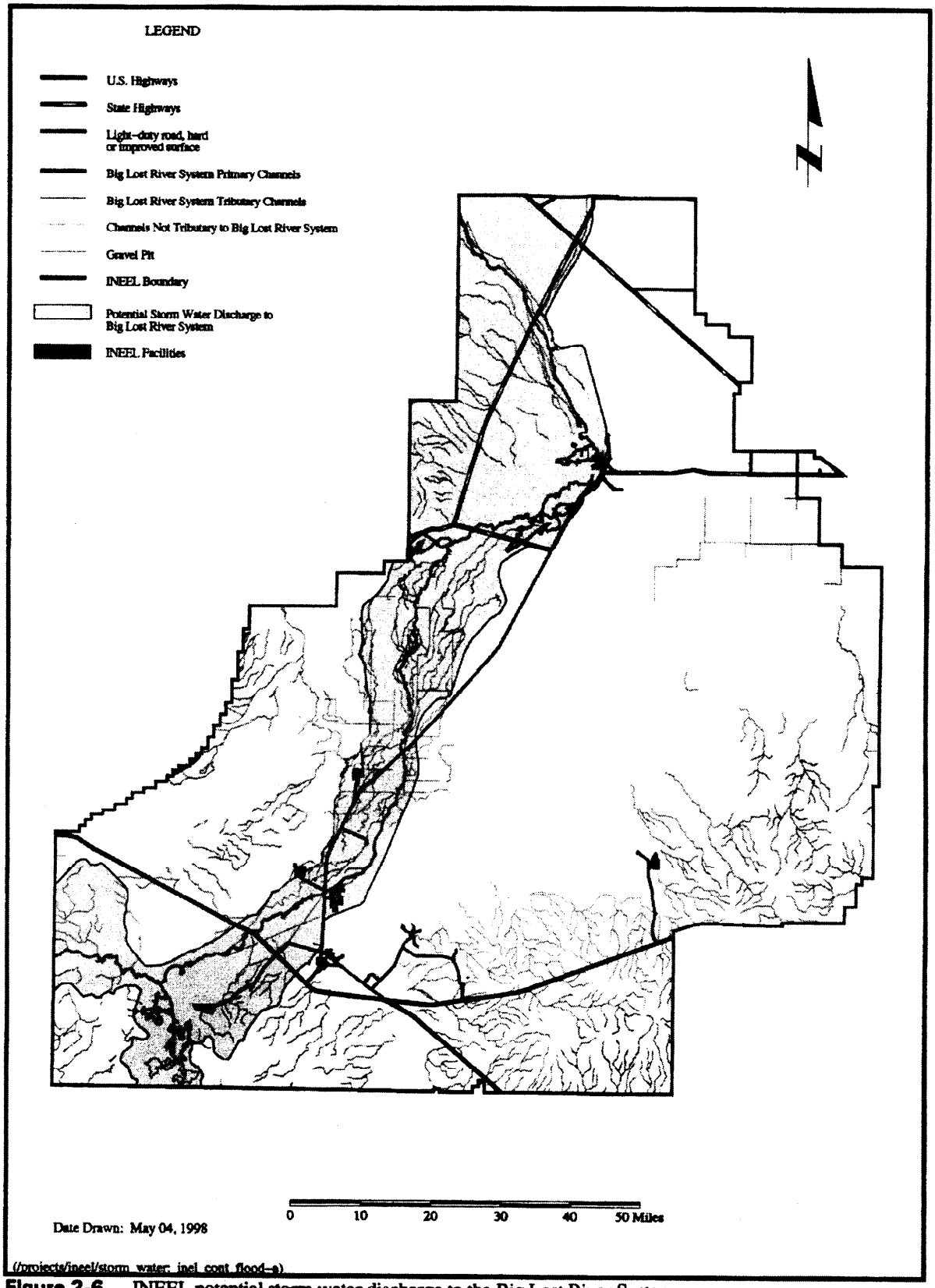

Figure 2-6. INEEL potential storm water discharge to the Big Lost River System